

REMARKS

The Applicants would like to thank the Examiner for review of the present application and the attention given in the resulting office action. Claims 1-23 were rejected under 35 USC 112, first paragraph as failing to comply with the written description requirement. Claims 1-20 were rejected under 35 USC 112, second paragraph as being incomplete for omitting essential elements. Claims 10,15, and 20 were rejected under 35 USC 112, second paragraph as being indefinite. Claims 1-23 were rejected under 35 USC103(a) as being unpatentable over Moncrief (US 4,949,119).

35 USC 112, first paragraph rejection

The claims were rejected by the Examiner for confusion regarding vehicle dynamic sensors and the integration with the present invention. The Examiner states “if the vehicle is being driven, the steering wheel will, by definition, be providing a real feel” ... and that “dynamic sensors would be redundant”.

The Applicant respectfully disagrees but recognizes the source of confusion. The present invention’s primary intent was application to “steer-by-wire” automobiles. The term “steer-by-wire” is well known and well defined within the automotive industry. In “steer-by-wire” systems the input device (steering wheel) has NO mechanical connections to the drive train or other mechanical steering systems. Instead, its sole connection is through electronic wires (hence steer-by-wire) that utilize electronic motors to control the steering systems. Thus, there is truly NO feedback to the steering wheel. Hence the development of the present invention wherein simulated steering feel is artificially reintroduced to the steering wheel. The Applicant respectfully notes the overly broad and vague claim language has been amended such that this is clear. As this application is not directed towards a standard mechanically based steering system, the Applicant asserts this rejection has been overcome. It should be noted that the definition of steer-by-wire inherently defines no mechanical steering connection and therefore the addition of this terminology is not new matter.

Claims 1-20, 35 USC 112, second paragraph rejection

Claims 1-20 were rejected under 35 USC 112, second paragraph for not properly describing the structural cooperative relationships between elements. The Applicant respectfully requests reconsideration in light of the aforementioned amendments. The Examiner expressed confusion as to where the feedback torque is coming from, how road feel is generated, and an incomplete omission of steps. The Applicant respectfully asserts all basis for this rejection has been overcome by the present amendments. The Applicant notes that on page 5 of the application as filed the specification provides a long list of vehicle dynamic characteristics that are monitored by the vehicle dynamic sensors. The vehicle dynamic sensors communicate this information to the steering feel control processor which in turn utilizes the servo disc motor to communicate the simulated torque to the steering wheel. In regards to a precise mathematical formulation as to how vehicle dynamics are translated into feedback torque, one is not necessary to practice the present invention without undue experimentation and is highly dependent on specific embodiments. By way of example, turning left at high speed (dynamic sensor information) may be used to develop a feedback torque adds right turning torque to the steering wheel. This provides a simulation of the normal force dynamics in a mechanically connected steering assembly. In regards to the vague relation of elements, the Applicant submits these rejections have been overcome by the present amendments.

Claims 10,15, and 20, 35 USC 112, second paragraph rejection

The Examiner rejects these claims as being indefinite. The Applicant is left to surmise that the Examiner finds the term “steer-by-wire” indefinite and was unsatisfied with the definitions afforded vehicle dynamics (claim 15) within page 5 of the specification. In regards to the definition of vehicle dynamics, the Applicant traverses this rejection and asserts that the definitions afforded vehicle dynamics on page 5 of the application are more than adequate to inform one skilled in the art. Furthermore, as discussed earlier in this office action, the term steer-by-wire is well known in the industry and therefore more than adequately supported. The Applicant surmises that this rejection may have been based more on the form of the claims as originally submitted and therefore may in fact be moot due to the aforementioned amendments.

Claims 1-23 were rejected under 35 USC103(a)

Claims 1-23 were rejected under 35 USC103(a) as being unpatentable over Moncrief (US 4,949,119). The Applicant respectfully requests reconsideration in light of the aforementioned amendments. The Applicant notes that the present claims are directed solely to a steer-by-wire automotive system and not a video game or other such device. They rely on monitoring of vehicle dynamics and development of artificial torque to transmit to the steering wheel. This is not taught by Moncrief and therefore deserves reconsideration.

CONCLUSION

The Applicants would like to thank the Examiner for his assistance. In light of the above amendments and remarks, Applicants submit that all objections and rejections are now overcome. Applicants have added no new material to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited.

Should the Examiner have any questions or comments that would place the application in better condition for allowance, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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Dated: April 29, 2004